Corrections to the SUPPLEMENT (2.1E) (continued)

In Appendix C

Page No.	Correction
C.52	Under REPORT LS–L, change a) to read as follows: a) The shading schedule for an exterior window specifies management. Change b) to read as follows: b) If the transmitted direct solar gain through an exterior window exceeds a pre-specified value MAX–SOLAR–SCH, then, with probability SUN–CTRL–PROB, shades will be in effect.
C.100	Delete first paragraph and replace with this: In this scatter plot, the ordinate, appearing in the left column, shows relative humidity bins. The abscissa, shown at the top, gives hours of the day; e.g., "1AM" corresponds to the hour between Midnight and 1AM. Entered in each cell of the plot is the number of hours during the RUN–PERIOD for which the relative humidity of the system return air was in the particular relative humidity bin for this particular hour of the day. Only hours for which the fans are on are counted in this plot.
C.104	Delete first paragraph and replace with this: Report SS–P is produced at both the SYSTEM and PLANT–ASSIGNMENT levels. The following description is for the SYSTEM–level report. See "REPORT SS–P (for PLANT–ASSIGNMENT)", following, for a description of the PLANT–ASSIGNMENT level.
C.135	Replace "MONTHLY PEAK AND TOTAL ENERGY USE" with "MONTHLY UTILITY AND FUEL USE SUMMARY".

* Recent LBL Report *

A recent report, "Advances in Window Technology: 1973-1993", was published as part of the American Solar Energy Society's annual review of current research and development. It is available from the Building Technologies Program. Please fax your request to Pat Ross at (510) 486-4089, and be sure to reference both the title and report number.

LBL-36891 - W6-329

Advances in Window Technology

by

Dariush Arasteh

Contents

Abstract

Until the 1970s, the thermal performance of windows and other fenestration technologies was rarely of interest to manufacturers, designers, and scientists. Since then, however, a significant research and industry effort has focused on better understanding window thermal and optical behavior, how windows influence building energy patterns, and on the development of advanced products. This chapter explains how fenestration technologies can make a positive impact on building energy flows, what physical phenomena govern window heat and light transfer, what new products have been developed, and what new products are currently the subject of international research efforts.

****

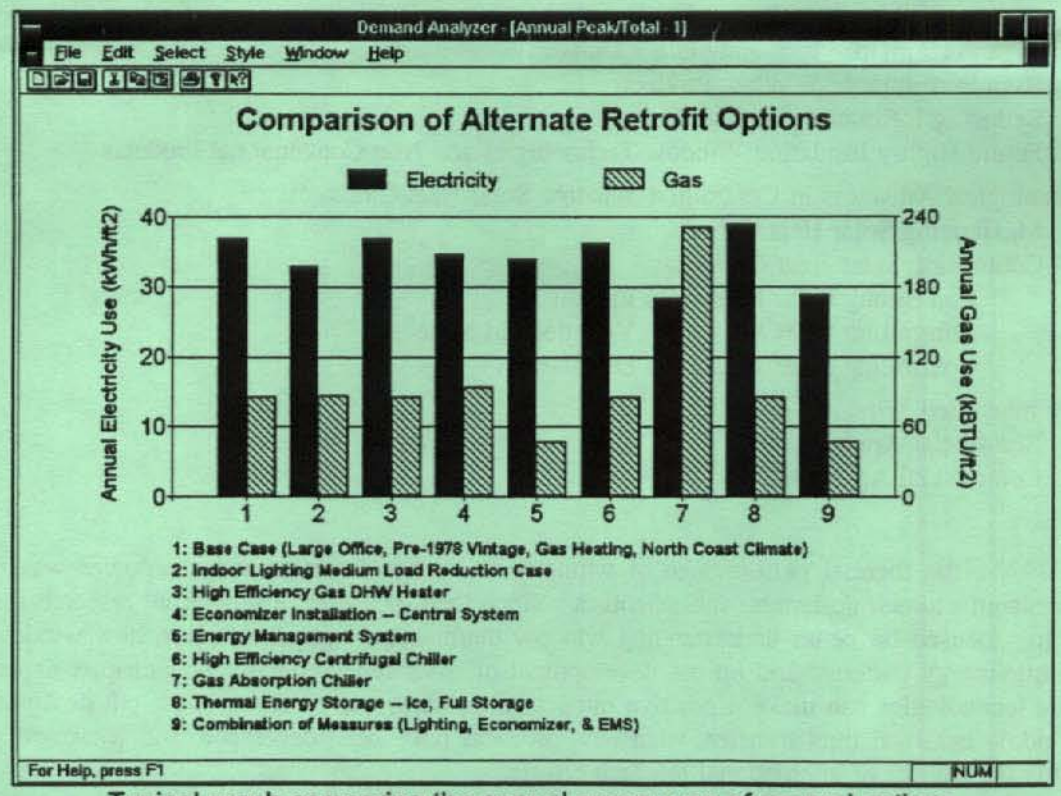
Demand Analyzer™

by Stephen Byrne, ITEM Systems, Seattle, WA

Demand Analyzer, developed by ITEM Systems, allows a user to quickly analyze buildings and energy conservation measures (ECMs) using DOE-2.1E, providing an ideal screening tool for a first analysis of ECMs in typical buildings. With Demand Analyzer, using DOE-2 is greatly simplified and because of the design of the interface, the user does not need to have any knowledge of how to operate the DOE-2 program or the DOE-2 Building Description Language.

Templates of eighteen building types, each with three vintages, are built into Demand Analyzer, thereby greatly reducing the input requirements. The templates have been developed through analyses of surveys and monitored data and represent the average of buildings of each type and vintage. The energy use of each basecase has been validated against data developed by electric and gas utilities from monitored buildings. The ECMs are based on commercially available products and represent a wide variety of options (several hundred) that are suitable for either retrofit or new construction. Online help provides a detailed description of each measure. Currently in use by several major utilities, universities and state regulatory organizations, Demand Analyzer represents the state-of-the-art in software that is both easy to use and highly accurate.

Buildings created in Demand Analyzer can be exported to DOE-Plus™ * for modification of any of the over 1200 DOE-2 commands and keywords, or it can be exported to Prep™ * for an automated parametric analysis that may involve dozens or thousands of DOE-2 simulations.



Typical graph comparing the annual energy use of several options

* DOE-Plus is a comprehensive pre- and post-processor for DOE-2, allowing interactive input, 3-D drawing of a building, and graphing of DOE-2 simulation results. Prep is a batch preprocessor that facilitates automated parametric simulations. For more information, please contact ITEM Systems.

Definition of a Building

The user defines one or more buildings by:

- Selecting one of 18 commercial or residential building types (see list below).
- Selecting one of the available climate regions.
- Selecting one of 3 building vintages: old (pre-1976), current (1976-91), or new (post 1991).
- Selecting the heating fuel type, either gas or electricity.

At this point the building is completely defined in the detail needed to do a DOE-2 simulation. Typical characteristics of the building type, vintage, and HVAC system are built into the software, so the user need not specify the complete building. However, it is possible to refine the building description as follows, if the defaults are not acceptable:

- Changing the characteristics of each building:
  floor area (within practical limits of the building geometry),
  schedules of operation (choice of either short or long hours of operation).
- Changing the characteristics of each type of zone in the building:
  window area (as a percent of wall area),
  occupant density (area per person),
  electrical equipment intensity (W/ft^2),
  thermostat setpoints for heating and cooling (with or without setback).
- Selecting any combination of one or more compatible energy conservation measures (see list below). The possibilities include changing the type of air handling equipment, central plant equipment, operating strategies, lighting, insulation, windows, etc. Online help provides a detailed description of each measure and how it is implemented in DOE-2.
- Changing efficiency levels of the conservation measures.

A summary of each defined building is shown in a separate window, so the user can define several similar buildings and quickly review the differences between them. Building descriptions can be saved to be reviewed or edited at a later time. Demand Analyzer will simulate any or all defined buildings, allowing the user to continue with other work while the simulations are being completed. The results of each simulation are stored in an internal database, so the results of several simulations can be easily retrieved and compared (see output features, below).

Optionally, after a building has been defined it can be exported to DOE-Plus™ for modification of any of the over 1200 DOE-2 commands and keywords, or it can be exported to Prep™ for an automated parametric analysis that may involve dozens or thousands of DOE-2 simulations.

Building Types

Large Office	Primary School	Hospital
Small Office	High School	Nursing Home
Large Retail	College	Hotel
Small Retail	Grocery Store	Motel
Fast-Food Restaurant	Refrigerated Warehouse	Single-Family Residence
Sit-Down Restaurant	Non-Refrig. Warehouse	Multifamily Residence

User News, Vol.16, No.1, 1995

Output Features

Simulation results are displayed graphically, allowing the user to examine the performance of a single building, or to compare the performance of multiple buildings. Demand Analyzer can display peak electrical demand as well as electricity and gas consumption (either total or by end use category) in monthly or annual formats. Hourly electrical load shapes can be displayed for three types of days each month. Graph formats include the following:

- Bar charts showing monthly consumption for one or two buildings, with separate, grouped bars representing different fuel types, or stacked bars representing different end uses for each month. Peak electrical demand can be superimposed as a line on top of the bars.

- Bar charts showing annual consumption for a baseline building and several other buildings representing alternate packages of conservation measures, with separate, grouped bars representing different fuel types (see example on the first page of this article), or stacked bars representing end uses for each building. Peak electrical demand can be superimposed as a line on top of the bars.

- Line charts showing 24-hour total electricity load shapes for up to 36 days (average weekday, average weekend day, and peak day, for each month) for one or more buildings.

- Pie charts showing before and after distribution of end uses (for a basecase and one alternate) that sum to total annual building energy use by fuel type.

The results can be displayed either as the total for each building or as the difference between a basecase building and several alternates. They can also be displayed either as consumption per square foot of floor area or as the building total. Multiple graphs can be displayed at the same time in separate windows to allow comparison of different quantities; for example, 24-hour load shapes and annual consumption.

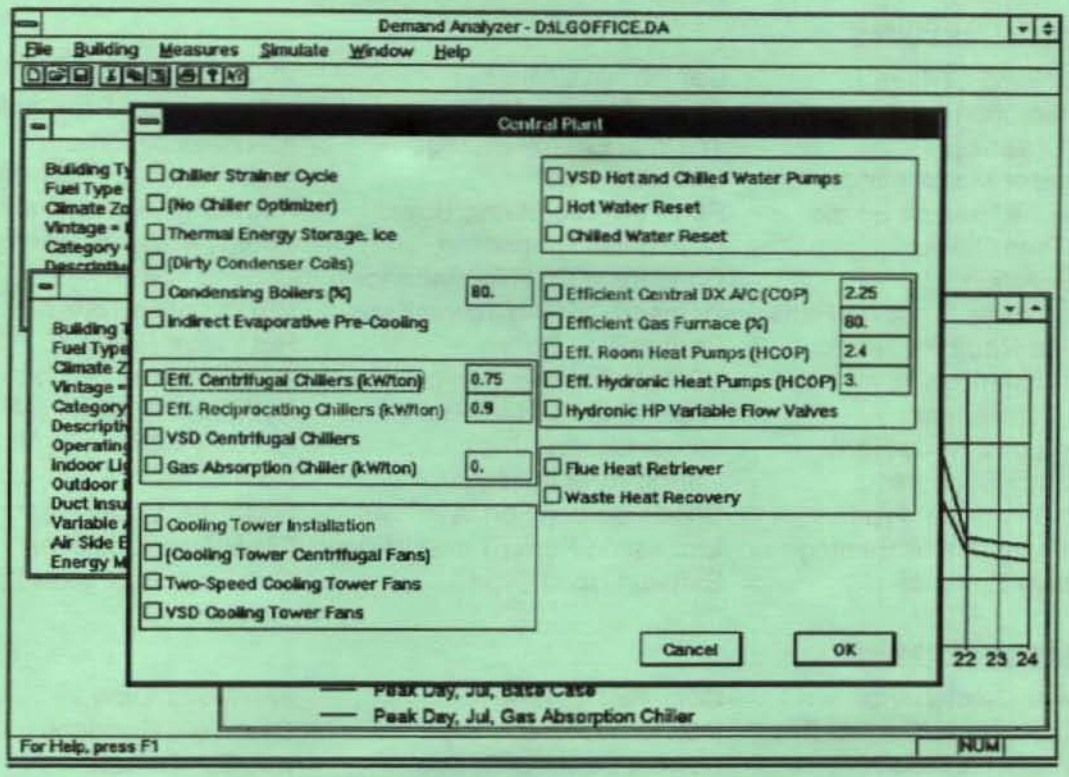
Each type of graph can be extensively modified by the user, including changing fonts, colors, data ranges, legends, titles, fill patterns, etc. Each modified "style" can be saved and used to display data from other buildings. Buildings or variables can easily be added or subtracted from each graph.

The data displayed in any of the graphs can be viewed directly or imported into another Windows application, such as a spreadsheet, for further analysis. The graphs can be printed to any Windows supported printer or may be imported into another Windows application, such as a wordprocessor, spreadsheet or graphics program.

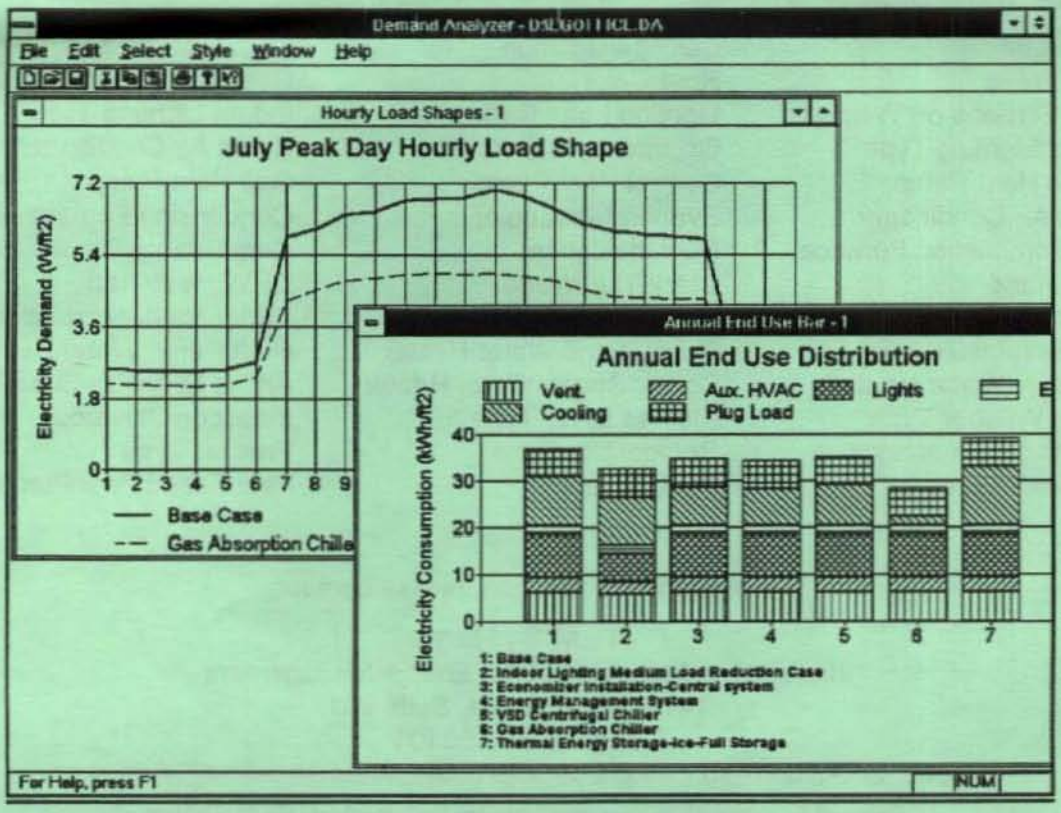
End Use Categories

Gas	Electricity	Electricity
Cooling	Cooling	Interior Lighting
Heating	Heating	Exterior Lighting
Domestic Hot Water	Ventilation & Exhaust	Exterior Miscellaneous
Exterior Miscellaneous	Auxiliary HVAC Pumps	Equipment & Appliances
Equipment & Appliances	Domestic Hot Water	Commercial Refrigeration

User News, Vol.16, No.1, 1995



ECMs are selected from menus; efficiencies of common products are built in or user defined.



Results are displayed in user defined graphs or tables that can be pasted into other applications.

User News, Vol.16, No.1, 1995

Commercial Measures

Reciprocating Chillers	Centrifugal Chillers	VSD Centrifugal Chillers
Gas Absorption Chillers	Chiller Strainer Cycle	Indirect Evap. Pre-Cooling
Chiller Optimizer	Thermal Energy Storage	Air-Side Economizer
Economizer Maintenance	Oversize Coils	Air-to-Air Heat Exchanger
Variable Air Volume Boxes	Fan Powered Mixing Boxes	Reducing Overventilation
HVAC Time Clocks	Deadband Thermostat	Energy Management System
Duct Insulation	Condensor Coil Maintenance	Cooling Tower
Cooling Tower Propeller Fans	2-Speed Cooling Tower Fans	VSD Cooling Tower
Flue Heat Retriever	Condensing Boilers	Hot Water Reset
Chilled Water Reset	VSD H&C Water Pumps	Gas Furnace
DX Air Conditioner	Water Source Heat Pump	Hydronic HP Var. Flow Valve
Lighting Load Reduction	Indoor Lighting Type	Outdoor Lighting Type
Occupancy Sensors	Ceiling/Roof Insulation	Roof Color
Over 200 Window Types	Shade Screens on Windows	Gas/Elec. Water Heater Type
Point of Use Water Heating	Circulation Pump Time Clocks	DHW Tank Insulation
Air Curtain Entrance	Exhaust Hood Type	Gas/Elec. Appliance Type

Refrigeration Measures

Extensive Maintenance	Compressor Type	Fan Motor Type
Heat Recovery w/Central Sys.	Waste Heat Recovery	Oversized Condenser
Evaporative Subcooler	Defrost Demand Control	Hot Gas Defrost
Display Case Night Covers	Display Case Glass Doors	Parallel Compressor Rack
Energy Management System	Floating Head Pressure	External Liquid Suction HX

Residential Measures

Wall Insulation	Ceiling Insulation	Floor Insulation
Shade Trees	Roof Color	Over 200 Window Types
Shade Screens on Windows	Lighting Load Reduction	Indoor Lighting Type
Outdoor Lighting Type	Occupancy Sensors	Room Air Conditioner
Window Heat Pump	Central Heat Pump	Gas Heat Pump
Central Air Conditioner	Evaporative Cooler	Condensing Furnace
Pulse Combustion Furnace	Duct Insulation	Duct Sealing
Ceiling Fans	Clock Thermostat	DHW Heat Trap
Hot Water Saver	Faucet Aerators	Water Heater Insulation
DHW Pipe Insulation	Gas/Electric Water Heater	Heat Pump Water Heater
Multifamily Water Heater	Comb. Space/Water Heater	A/C to DHW De-Superheater
Clothes Washer Type	Clothes Dryer Type	Induction Stovetop
Appliance Maintenance	Refrigerator Type	Freezer Type
Pool Heater Type	Pool Covers	Two Speed Pool Pump

For further information, please contact:

ITEM Systems
Innovative Technologies for Energy Management
1402 Third Avenue, Suite 901
Seattle, WA 98101
Phone: 206-382-1440 Fax: 206-382-1450 Internet: admin@item.com

User News, Vol.16, No.1, 1995

* Calendar of Meetings and Conferences *

Jun 6-10 — *ECEEE 1995 Summer Study*

to be held in Latitudes, Mandelieu, France.
Theme: Sustainability and the Reinvention of Government: A Challenge for Energy Efficiency.
Contact: European Council for an Energy-Efficient Economy, c/o NUTEK/DOEE, 117 86 Stockholm, Sweden.
Phone Agnetta Persson at (46) 8 744-9500, Fax (46) 8 744-0939.

* *

Jun 18-21 — *Right Light Three: Third European Conference on Energy-Efficient Lighting*

to be held in Newcastle-Upon-Tyne, England.
Sponsor: International Association for Energy-Efficient Lighting and others.
Contact: RightLight Three, Carliol House, Market Street, Newcastle-Upon-Tyne, England NE1 6NE.
Phone (44) 91 235 2801, Fax (44) 91 235 2898.

* *

Jun 24-28 — *ASHRAE Annual Meeting*

to be held in San Diego, CA. San Diego Marriott Hotel & Marina.
Contact: ASHRAE Meetings Section, 1791 Tullie Circle NE, Atlanta, GA 30329.
Phone (404) 636-8400, Fax (404) 321-5478.

* *

Jun 26-27 — *Preconference Workshops*
Jun 28-30 — *7th Annual DSM Conference*

to be held in Dallas, Texas.
Host Utility: TU Electric
Sponsors: Synergic Resources Corporation, Electric Power Research Institute, U.S. Department of Energy, and Edison Electric Institute.
Registration Information: Pam Turner, EPRI, P.O. Box 10412, Palo Alto, CA 94303. Phone (415) 855-8900, Fax (514) 855-2041.
Technical Information: Bill Leblanc, Phone (415) 855-8900.

* *

Jul 15-20 — *Solar '95*

Sponsored by: The American Solar Energy Society and the Minnesota Renewable Energy Society.
Contact: The American Solar Energy Society, 2400 Central Avenue G-1, Boulder, CO 80301. Phone: (303) 443-3130.

* *

Jul 24-26 — *SCSC '95*

Summer Computer Simulation Conference 1995. To be held in Ottawa, Ontario, Canada.
Host: The Ottawa Center of the McLeod Institute of Simulation Sciences, Computer Science Department, University of Ottawa
Sponsored by: The Society for Computer Simulation, 4838 Ronson Court, Suite L, San Diego, CA 92111-1810.
Phone: (619) 277-3888, Fax (619) 277-3930, email scs@sdsc.edu

* *

Aug 1-4 — *ACEEE 1995*

Summer Study on Energy Efficiency in Industry. To be held in Grand Island, New York.
Host: New York State Energy Research and Development Authority.
Contact: Katherine Gallagher, ACEEE Conference Office, 2140 Shattuck Avenue Suite 202, Berkeley, CA.
Phone: (510) 549-9914, Fax (510) 549-9984, email Kath@bea.lbl.gov

* *

Aug 14-16 — *4th IBPSA Conference*

4th International Building Performance Simulation Association Conference. To be held in Madison, Wisconsin.
Contact: John Mitchell, Mechanical Engineering Dept., University of Wisconsin, 1500 Johnson Drive, Madison, WI 53706-1687.
Phone: (608) 262-5972, Fax (608) 262-8464.

* *

Aug 23-25 — *Energy Program Evaluation: Uses, Methods, and Results*

To be held in Chicago, IL.
Contact: Ms. Gail Ettinger, National Energy Program Evaluation Conference, 309 Davis Street, Evanston, IL 60201.
Phone: (708) 864-5651, Fax (708) 864-7535.

* * * * DOE-2 DIRECTORY * * * *

Program Related Software and Services

Mainframe and Workstation Versions of DOE-2

DOE-2.1D and 2.1E (Source code, executable code and documentation) For 2.1E DEC-VAX, Order #000158-DOVAX-02 For 2.1E SUN-4, Order #000158-SUN-0000 For 2.1D DEC-VAX, Order #000158-D6220-01 For a complete listing of the software available from ESTSC order their "Software Listing" catalog ESTSC-2.	Energy Science and Technology Software Center P.O. Box 1020 Oak Ridge, TN 37831-1020 Phone: (615) 576-2606 FAX: (615) 576-2865 email: ESTSC@ADONIS.OSTI.GOV web: http://www.doe.gov/html/osti/estsc/estsc.html
FTI-DOEv2.1E (Source code and documentation) Combined source code package for both VAX and SUN versions of DOE-2.1E. Available on most distribution formats and for most operating systems (1/4" QIC tape, TK50 tape, 3.5" floppy, etc). Note: this is the distribution package only, no executables. Complete documentation for DOE-2.1E, digitally reproduced, spiral bound, and separated into multi-volume sets. [See *User News* Vol.12, No.4, p.16]	Finite Technologies, Inc 821 N Street, #102 Anchorage, AK 99501 Contact: Scott Henderson Phone: (907) 272-2714 FAX: (907) 274-5379 email: scott@finite-tech.com web: http://www.finite-tech.com/

PC Versions of DOE-2

ADM-DOE2 ADM-DOE2 (DOE-2.1E) is the most recent version of DOE-2.1E. This release is compiled for use on a 386 or 486 personal computer. It runs in a DOS or Windows environment and is a highly reliable and tested version of DOE-2. The package contains everything needed to run the program: program files, utilities, sample input files, and weather files. More than 300 weather files are available (TMY, TRY, WYEC, CTZ formats) for the U.S. and Canada. [See *User News* Vol.7, No.2, p.6]	ADM Associates, Inc. 3239 Ramos Circle Sacramento, CA 95827 Contact: Marla Sullivan, Sales Alex Lekov, Support Phone: (916) 363-8383 FAX: (916) 363-1788
CECDOEDC (Version 1.0A) A microcomputer version of DOE-2.1D integrated with a pre- and post-processing system designed strictly for compliance use within the State of California. It generates some of the standard compliance forms as output. Order P40091009 for the CECDOEDC Program with Manuals. Order P40091010 for the DOE-2.1 California Compliance Manual. [See *User News* Vol.12, No.4, p.13]	Publication Office California Energy Commission P.O. Box 944295 Sacramento, CA 94244-2950 web: http://agency.resource.ca.gov/cectext/ETEC.html

Caveat: We list third-party DOE-2-related products and services for the convenience of DOE-2 users, with the understanding that the Simulation Research Group does not have the resources to check the DOE-2 program adaptations and utilities for accuracy or reliability.

User News, Vol.16, No.1, 1995

PC Versions of DOE-2 (continued)

DOE-24/Comply-24 DOE-24 is a special DOE-2 release which is both a California-approved compliance program for the state's 1992 non-residential energy standards, and a stand-alone version of DOE-2.1E that includes a powerful yet easy-to-use input preprocessor. A demonstration program is available upon request. [See *User News* Vol.12, No.2, p.2]	Gabel Dodd Associates 1818 Harmon Street Berkeley, CA 94703-2416 Contact: Rosemary Howley Phone: (510) 428-0803 FAX: (510) 428-0324
DOE-Plus™ DOE-Plus, a complete implementation of DOE-2.1D, is used to interactively input a building description, run DOE-2, and plot graphs of simulation results. Features include interactive error checking, context-sensitive help for all DOE-2 keywords, a 3-D view of the building that can be rotated, and several useful utilities. Also from ITEM Systems: **Demand Analyzer™**, uses templates of building types and vintages to simplify DOE-2 input requirements. Online help feature. **Prep™**, a batch preprocessor, ideal for parametric studies, that enables conditional text substitution, expression evaluation, and spawning of other programs. [See *User News* Vol.11, No.4, p.4 and Vol.13, No.2, p.54, and Vol.16, No.1, p.28-32	ITEM Systems 1402 - 3rd Avenue, #901 Seattle, WA 98101 Contact: Steve Byrne Phone: (206) 382-1440 FAX: (206) 382-1450 email: byrne@item.com
EZDOE EZDOE is an easy-to-use PC version of DOE-2.1D. It provides full screen, "fill in the blank" data entry, dynamic error checking, context-sensitive help, mouse support, graphic reports, a 750-page user manual, extensive weather data, and comprehensive customer support. EZDOE integrates the full calculation modules of DOE-2 into a powerful, full implementation of DOE-2 on DOS-based 386 and 486 computers. [See *User News* Vol.14, No.2, p.10 and No.4, p.8-14]	Elite Software, Inc. P.O. Drawer 1194 Bryan, TX 77806 Contact: Bill Smith Phone: (409) 846-2340 FAX: (409) 846-4367 email: 76070,621@compuserve.com
FTI-DOEv2.1E Highly optimized version of DOE-2.1E software, available for most computing systems. Current support: MSDOS and Windows 3.x, Windows NT, OS/2, RS/6000 (AIX), NeXT, SUN, UNIX (most systems). Call for platforms not listed. Documentation and weather files are available. Also FTI-DOEv2.1E source code, highly optimized and portable version; will compile for most systems. [See *User News* Vol.12, No.4, p.16]	Finite Technologies, Inc 821 N Street, #102 Anchorage, AK 99501 Contact: Scott Henderson Phone: (907) 272-2714 FAX: (907) 274-5379 email: scott@finite-tech.com web: http://www.finite-tech.com/

PC Versions of DOE-2 (continued)

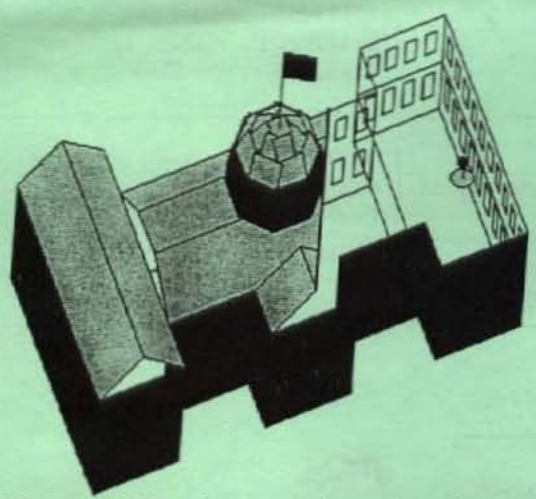
MICRO-DOE2™ MICRO-DOE2 (2.1E), which runs in a DOS or Windows environment, is a widely used, reliable, and tested PC version of DOE-2. It includes automatic weather processing, batch file creation, and a User's Guide with instructions on how to set up a RAM drive. System requirements: 386/486 PCs with 4 MB of RAM and math co-processor. Also from ERG/Acrosoft: **NETPath**, a network edition of MICRO-DOE2 allows you to store and run DOE-2 application files on one machine using input files from another machine. The result is improved space usage and project file management. **POWERPath**, for single machines, allows you to keep MICRO-DOE2 application files in one directory and submit input from any other directory. [See *User News* Vol.7, No.4, p.2; Vol.11, No.1, p.2; Vol.15, No.1, p.8; and Vol.15, No.3, p.4,]	ERG/Acrosoft International, Inc. 12138 West Brittany Avenue Littleton, CO 80127 Phone: (303) 904-3233 FAX: (303) 904-3234 email: erga@igc.apc.org MICRO-DOE2 Support: Gene Tsai, P.E. Phone: (303) 721-6556 FAX: (303) 904-3234
PRC-DOE2 A fast, robust and up-to-date PC version of DOE-2.1E. Runs in extended memory, is compatible with any VCPI compliant memory manager and includes its own disk caching. 377 weather data files available (TMY, TRY, WYEC, CTZ) for the U.S. and Canada Also from the Partnership for Resource Conservation: **PRC-TOOLS**, a set of PC programs that aids in extracting, analyzing and formatting hourly DOE-2 output. Determines energy use, demand, and cost for any number of end-uses and periods. Automatically creates 36-day load shapes. Custom programs also available. [See *User News* Vol.13, No.4, p.11, Vol.14, No.2, p.9, and Vol.15, No.1, p.5]	Partnership for Resource Conservation 140 South 34th Street Boulder, CO 80303 Contact: Paul Reeves Phone or FAX: (303) 499-8611 email: paulreeves@aol.com
VisualDOE for Windows™ VisualDOE, which uses DOE-2.1E as the calculation engine, enables architects and engineers to quickly evaluate the energy savings of HVAC and other building design options. Program is supported by context-sensitive on-line help. Program includes climate data for the 16 California weather zones. [See *User News* Vol.15, No.2, p.10]	Eley & Associates 142 Minna Street San Francisco, CA 94105 Contact: Charles Eley or John Kennedy Phone: (415) 957-1977 FAX: (415) 957-1381

Meteorologists have long known that cities are warmer than the surrounding countryside. The "urban heat island" is especially pronounced on calm, clear nights, when even towns of a few thousand inhabitants can be several degrees milder. Meteorologists will have no shortage of urban heat islands to study; by the year 2000 it is expected there will be 400 cities on the planet with populations exceeding one million.

Pre- and Post-Processors for DOE-2

D O E 1 2 3 Uses Lotus 1-2-3 to graphically display DOE-2.1D output as barcharts, pie charts, and line graphs. [See *User News* Vol.10, No.3, p.5]	Ernie Jessup 4977 Canoga Avenue Woodland Hills, CA 91364 Phone: (818) 884-3997
DrawBDL Graphic debugging and drawing tool for DOE-2 building geometry that runs on PC's under Microsoft Windows. DrawBDL reads your BDL input and makes a rotatable 3-D drawing of your building with walls, windows and building shades shown in different colors for easy identification. [See *User News* Vol.14, No.1, p.5-7 and Vol.14, No.4, p.16-17]	Joe Huang & Associates 6720 Potrero Avenue El Cerrito CA 94530-2248 Contact: Joe Huang Phone/FAX: (510) 236-9238
Graphs for DOE-2 2-D, 3-D, hourly, daily, and psychrometric plots [See *User News* Vol.13, No.1, p.5]	Energy Systems Laboratory Texas A&M University College Station, TX 77843-3123 Contact: Jeff Haberl Phone : (409) 845-6065 FAX: (409) 862-2762
Pre-DOE A math pre-processor for BDL.	Nick Luick 19030 State Street Corona, CA 91719 Phone: (714) 278-3131

Upgrade to DrawBDL



Joe Huang and Associates recently made an incremental upgrade to the DrawBDL program (now Version 2.02). They corrected some minor errors (such as showing windows on interior walls) and added a feature that allows you to launch the program with an attached filename, i.e., "DrawBDL [filename]".

This upgrade was mailed free of charge to all new or upgrade customers of DrawBDL (Version 2.0). If you have Version 2.0 but haven't received this upgrade, or would like more information about this graphical debugging and drawing program for DOE-2 building geometry, please contact us at 6720 Potrero Avenue, El Cerrito CA 94530-2248, Phone/Fax (510) 236-9238.

DOE-2.1E Bug Fixes via FTP

If you have Internet access you can now obtain the latest bug fixes to DOE-2.1E by anonymous ftp. The procedure is as follows:

ftp gundog@lbl.gov
(or)
ftp 128.3.254.10
login: anonymous
passwd: your email address

After logging on, go to directory "pub/21e-mods"; bug fixes are in files "*.mod". A description of the fixes is in file VERSIONS.txt in directory "pub". Each fix has its own version number, *nnn*, which is printed out as DOE-2.1E-*nnn* on the DOE-2.1E banner page and output reports when the program is recompiled with the fix.

You may direct questions about accessing or incorporating the bug fixes to Ender Erdem (ender%gundog@lbl.gov).

User News, Vol.16, No.1, 1995

RESOURCES

User News Sent without charge to DOE-2 users, the newsletter prints documentation updates and changes, bug fixes, inside tips on using the program more effectively, and articles of special interest to program users. Regular features include a directory of program-related software and services and an order form for documentation. In the summer issue an alphabetical listing is printed of all commands and keywords in DOE-2, and where they are found in the documentation. The winter issue features an index of articles printed in all the back issues.	Simulation Research Group Bldg. 90, Room 3147 Lawrence Berkeley Laboratory Berkeley, CA 94720 Contact: Kathy Ellington Phone: (510) 486-5711 FAX: (510) 486-4089 e-mail: kathy%gundog@lbl.gov
Help Desk – Bruce Birdsall Call or fax our DOE-2 expert, Bruce Birdsall, if you have a question about using DOE-2. If you need to fax an example of your problem to Bruce, please be sure to telephone him prior to sending the fax. This is a **free** service provided by the Simulation Research Group at Lawrence Berkeley Laboratory.	Bruce Birdsall Ph/Fx: (510) 829-8459 Monday through Friday 10 a.m. to 3 p.m. Pacific Time
Training DOE-2 courses for beginning and advanced users. DOE-2 training for small groups and individuals.	Energy Simulation Specialists 64 East Broadway, Suite 230 Tempe, AZ 85282 Contact: Marlin Addison Phone: (602) 967-5278 Gary H. Michaels, P.E. 1512 Crain Street Evanston, IL 60202 Phone: (708) 869-5859
Instructional DOE-2 Video and Manual Takes you step-by-step in DOE-2.1D input preparation and output interpretation.	JCEM/U. Colorado Campus Box 428 Boulder, CO 80309-0428 Contact: Prof. Jan Kreider Phone: (303) 492-3915

Need Help?? Call Bruce!
Call or fax our DOE-2 expert, Bruce Birdsall, if you have a question about advanced modeling techniques. If you need to fax an example of your problem, please be sure to telephone him beforehand. This service is supported by the Simulation Research Group. Phone or Fax: (510) 829-8459.

User News, Vol.16, No.1, 1995

Weather Data Comprehensive collection of weather files including the latest TRY, TMY and CTZ libraries from NCDC. All files can be used on all PC versions of DOE-2. Includes original source data and pre-formatted packed versions on a single IBM format CD. For Canadian users, the CD contains five weather files representing the five climate regions established by the Canadian energy codes. Individual sites available.	Jenny Lathum or Martyn Dodd EnergySoft 100 Galli Drive, Suite 1 Novato, CA 94949 Phone: (800) 4 NRG SFT or (800) 467-4738 Fax: (415) 883-5970
European Weather Files	Andre Dewint Alpha Pi, s.a. rue de Livourne 103/12 B-1050 BRUXELLES Belgium Phone: 32-2-649-8359 FAX: 32-2-649-9437
TMY (Typical Meteorological Year) TRY (Test Reference Year)	National Climatic Data Center 151 Patton Avenue, #120 Asheville, North Carolina 28801 Phone: (704) 271-4871 order desk Phone: (704) 271-4800 main number Fax: (704) 271-4876
CTZ (California Thermal Climate Zones)	California Energy Commission Bruce Maeda, MS-25 1516-9th Street Sacramento, CA 95814-5512 1-800-772-3300 Energy Hotline
WYEC (Weather Year for Energy Calculation)	ASHRAE 1791 Tullie Circle N.E. Atlanta, GA 30329 (404)636-8400 / Fax: (404)321-5478
Canadian Weather Files in WYEC2 Format	Dr. Didier Thevenard Watsun Simulation Laboratory University of Waterloo Waterloo, Ont., Canada N2L 3G1 Phone: (519) 888-4904 Fax: (519) 888-6197 e-mail: watsun@helix.watstar.uwaterloo.ca
The original long-term data sets (up to 40 years of data) from which the CWEC files were derived can also be obtained directly from Environment Canada.	Contact Mr. Robert Morris Phone: (416) 739-4361

* * DOE–2 ENERGY CONSULTANTS * *	
Consulting Engineers Charles Fountain Burns & McDonnell Engineers 8055 E. Tufts Avenue, Suite 330 Denver, CO 80237 (303) 721-9292	**Consultant** Greg Cunningham Cunningham + Associates 512 Second Street San Francisco, CA (415) 495-2220
Consultant Philip Wemhoff 1512 South McDuff Avenue Jacksonville, FL 32205 (904) 632-7393	**Consultant** Jeff Hirsch 12185 Presilla Road Camarillo, CA 93012 (805) 532-1045
Consultants Charles Eley, John Kennedy Eley Associates 142 Minna Street San Francisco, CA 94105 (415) 957-1977	**Computer-Aided Mechanical Engineering** Mike Roberts Roberts Engineering Co. 11946 Pennsylvania Kansas City, MO 64145 (816) 942-8121
Consultant Steven D. Gates, P.E. Building HVAC Design/Performance Modeling 11608 Sandy Bar Court Gold River, CA 95670 (916) 638-7540	**Consultant** Donald E. Croy CAER Engineers, Inc. 814 Eleventh Street Golden, CO 80401 (303) 279-8136
Mechanical Engineers Chuck Sherman Energy Simulation Specialists 64 East Broadway, Suite 230 Tempe, AZ 85282 (602) 967-5278	**Energy Engineering: Commercial & Institutional** Michael W. Harrison, P.E. 139 Bluebird Lane Whitehall, MT 59759 (406) 287-5370
Consultants Shiva Subramanya Criterion, Inc. 5331 SW Macadam Ave., Suite 205 Portland, OR 97201 (503) 224-8606	**Hourly Calibrated DOE-2 Analysis** Jeff S. Haberl Energy Systems Laboratory Texas A&M University College Station, TX 77843-3123 (409) 845-6065
Consultant Martyn C. Dodd Gabel Dodd Associates 100 Galli Drive, Suite 1 Novato, CA 94949 (415) 883-5900	**Consulting Engineers** Prem N. Mehrotra General Energy Corporation 230 Madison Street Oak Park, IL (708) 386-6000
Energy Management Specialists Hank Jackson, P.E. P.O. Box 675 Weaverville, NC 28787-0675 (704) 658-0298	**Consultant/Building Systems Analysis** Robert H. Henninger, P.E. ElectroCom GARD Ltd. 2070 Maple Street Des Plaines, IL 60018-3019 (708) 699-3252

User News, Vol.16, No.1, 1995

* * DOE-2 ENERGY CONSULTANTS (continued) * *	
Consulting Engineers/Computer Simulation Sciences Robert E. Gibeault A-TEC 5515 River Avenue, Suite 301 Newport Beach, CA 92663 (714) 548-6836	**Energy Consultants** Gene Tsai ERG/Acrosoft International, Inc. 12138 West Brittany Avenue Littleton, CO 80127 (303) 233-4453
Consulting Engineers Susan Reilly Enermodal Engineering 1554 Emerson Street Denver, CO 80218 (303) 861-2070	**Technical Real World Analysis** David J. Schwed Romero Management Associates 1805 West Avenue K, #202 Lancaster, CA 93534 (805) 940-0540
Energy Codes – DSM Doug Mahone The Heshong Mahone Group 4610 Paula Way Fair Oaks, CA 95628 (916) 962-7001	**Consulting Engineers** Gregory Banken, P.E. Q-Metrics, Inc. P.O. Box 3016 Woodinville, WA 98072 (205) 915-8590
Energy/DSM-Consultants Adrian Tuluca Steven Winter Associates 50 Washington Street Norwalk, CT 06854 (203) 852-0110	**Consulting Energy Engineers** Gary H. Michaels, P.E. 1512 Crain Street Evanston, IL 60202 (708) 869-5859
Consultant/Building Systems Engineering Ellen Franconi 1504 Grant Street Berkeley, CA 94703 (510) 559-8340	**Consulting Engineer** Robert Mowris, P.E. 1084 Sterling Avenue Berkeley, CA 94708 (510) 549-0557
Consultant Engineers David A. Cohen Architectural Energy Corporation 2540 Frontier Avenue, #201 Boulder, CO 80301 (303) 444-4149	**Modeling Specialist** Norm Weaver Interweaver Consulting 4915 South Elati Street Englewood, CO 80110 (303) 762-9510
Energy Engineering and Analysis Leo Rainer Davis Energy Group, Inc. 123 C Street Davis, CA 95616 (916) 753-1100	**Space Available**
Space Available	**Space Available**

User News, Vol.16, No.1, 1995

* DOE-2 ENERGY CONSULTANTS - INTERNATIONAL *	
Mainframe DOE-2 for European Users Joerg Tscherry EMPA, Section 175 8600 Dubendorf Switzerland	**Energy Consultant** Philipp Schluchter Institut fur Bauphysik Klein Urs Graf-Strasse 1 CH4052 Basel Switzerland
Consultant Werner Gygli Informatik Energietechnik Weiherweg 19 CH-8604 Volketswil Switzerland	**Consultant, Distributor for FTI-DOEv2.1E** Andre Dewint rue de Livourne 103/12 B-1050 BRUXELLES Belgium
MICRO-DOE2 (2.1E) Sales and Service Curt Hepting, P.Eng. ERG International Consultants 806-283 Davie Street Vancouver, B.C. V6B 5T6 Canada	**Space Available**

World-Wide Web Site Related to Energy Efficiency

California Energy Commission's Energy Technology and Education Center
http://agency.resource.ca.gov/cectext/ETEC.html

Energy centers are proving to be a popular and useful tool in demonstrating to customers how to adopt and invest in new energy efficiency technologies. In fact, in many cases, the energy centers have become an integral part of selling the utilities' demand side management programs. Most of these centers have focused their services on commercial and industrial customers and design and building professionals providing a site to showcase and demonstrate the latest products and advances in HVAC, lighting, industrial and commercial energy efficiency, extensive educational programs with hands-on seminars and training workshops, lab facilities for lighting mock-ups and a resource library with information on the latest energy efficient products and design techniques.

The California Energy Commission's Energy Technology and Education Center (ETEC) is being designed to function both as an on-site educational center with an energy resource library and an energy information center with displays and exhibits showcasing California's energy system and resources and as an on-line electronic data base and information clearinghouse to serve the needs of a broad range of constituents. The Commission believes that the ETEC will serve as an important resource and focus for the energy community and industry today and in the future.

The ETEC will be housed in the existing headquarters building of the California Energy Commission, 1516 Ninth Street, Sacramento, and is scheduled to be fully operational by Spring 1996. The existing library now houses the most complete and detailed technical energy and policy collections in California and is opened to the public. Other informational services such as the Energy Hotline for Building Standards are also available.

For more information on the California Energy Technology and Education Center please contact:

Susanne Garfield-Jones, Project Manager
Media & Public Communications Office
California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814
Phone: (916) 654-4989, Fax: (916) 654-4420

* * DOE–2 RESOURCE CENTERS * *

The people listed here have agreed to be primary contacts for DOE-2 program users in their respective countries. Each resource center has the latest program documentation, all back issues of the User News, and recent LBL reports pertaining to DOE-2. In the future, these resource centers will receive copies of all new reports and documentation. Program users can then make arrangements to get photocopies of the new material for a nominal cost. We hope to establish resource centers in other countries; please contact us if you are interested in establishing a center in your area.

South America

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World–Wide Web Sites Related to Energy Efficiency	
The International Commission on Illumination - CIE **http://www.hike.te.chiba-u.ac.jp/ikeda/CIE/publ/110-94.html**	**EREN: Energy Efficiency and Renewable Energy Network of the U.S. Department of Energy** **http://www.eren.doe.gov/**
Abbreviated from its French title Commission Internationale de l'Eclairage, CIE is an organization devoted to international cooperation and exchange of information among its member countries on all matters relating to the science and art of lighting. The CIE is an autonomous organization. It was not appointed by any other organization, political or otherwise, but has grown out of the interests of individuals working in illumination. Since its inception, the CIE has been accepted as representing the best authority on the subject and as such is recognized by the ISO as an international standardization body. For more information on the CIE, please contact: Dr. Janos Schanda, Executive Director Commission Internationale de l'Eclairage Kegelgasse 27 A-1030 Wien AUSTRIA Phone: +43 7143187-0 Fax: +43(1) 713 0838 18 E-Mail: X0401DAA@VM.UNIVIE.AC.AT	Welcome to the Department of Energy's (DOE's) Energy Efficiency and Renewable Energy Network (EREN), a World Wide Web site that locates and organizes qualitative information about renewable energy and energy efficient technologies. EREN links to over 70 different Internet sites that contain valuable information on energy efficiency and renewable energy (EE/RE) topics. The information is easily searched by a global keyword search of all sites in EREN. Information is also organized by broad subject divisions, type of service, type of organization, and by an alphabetical listing of sites. Please take a look at What's New on EREN and consider joining the EREN Users Group. Sites within EREN include: News-Events-Hot Topics, About EE, Energy Information Resources, Other Information Resources, and User Services.

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